



SKIN LAB MEDICAL
— ACADEMY —

Anatomy & Physiology



Welcome to our A&P Lv. 3/4 Course!

Introduction

When thinking about the body we can analyse its systems and functions into 11 categories:

Circulatory system

- This is the circulation of the blood via the heart, veins and arteries thus delivering oxygen and the required nutrients to essential organs and disposing of waste products.
- Maintaining the temperature of the body within acceptable and safe range

Digestive System

- This absorbs nutrients and removal of waste products via the gastrointestinal tract, which includes the stomach, intestines, oesophagus, and mouth.
- Eradicates waste products from the body.

Endocrine System

- The various functions of the body are influenced by using hormones.

Integumentary System

- Skin, Hair, Nails, Sweat and other exocrine glands.

Lymphatic System and Immune System

- The bodies defensive system against harmful pathogens
- This is a system or network of lymphatic vessels that transport a clear fluid known as lymph.

Muscular System

- Enables the body to move using muscles.

Nervous System

- Collects and processes information from the senses via nerves and the brain and tells the muscles to contract to cause physical actions.

Urinary System and Renal System

- The system where the kidneys filter blood to produce urine and get rid of waste.

Reproductive System

- These are for procreation.

Respiratory System

- This allows for air flow (in and out) to absorb oxygen and the removal of carbon dioxide.

Skeletal System

- Bones maintain the structure of the body and its Organs.

Dermatology of the Skin

The skin is the largest organ in the Human body and has a surface area of approximately 1.6 to 2m sq. Its total weight accounts for 1/6th of body weight and thickness varies the thinnest areas are the chin, eyelids, and chin and thickest being the sole of the foot.

Various structures are as a result of the skin which include sweat, nails and hair and sebaceous glands which facilitates the functions of the skin to perform efficiently and effectively.

What are the functions of the skin? These include the following:

- Temperature and Heat Control
- Protection (e.g., harmful rays from the sun)
- Absorption
- Touch
- Secretion and Excretion

DIFFERENT TYPES OF SKIN TISSUE

The skin consists of 3 Main layers.

Epidermis; about **0.0mm – 0.1mm**

Microblading (0.08mm – 0.15mm)

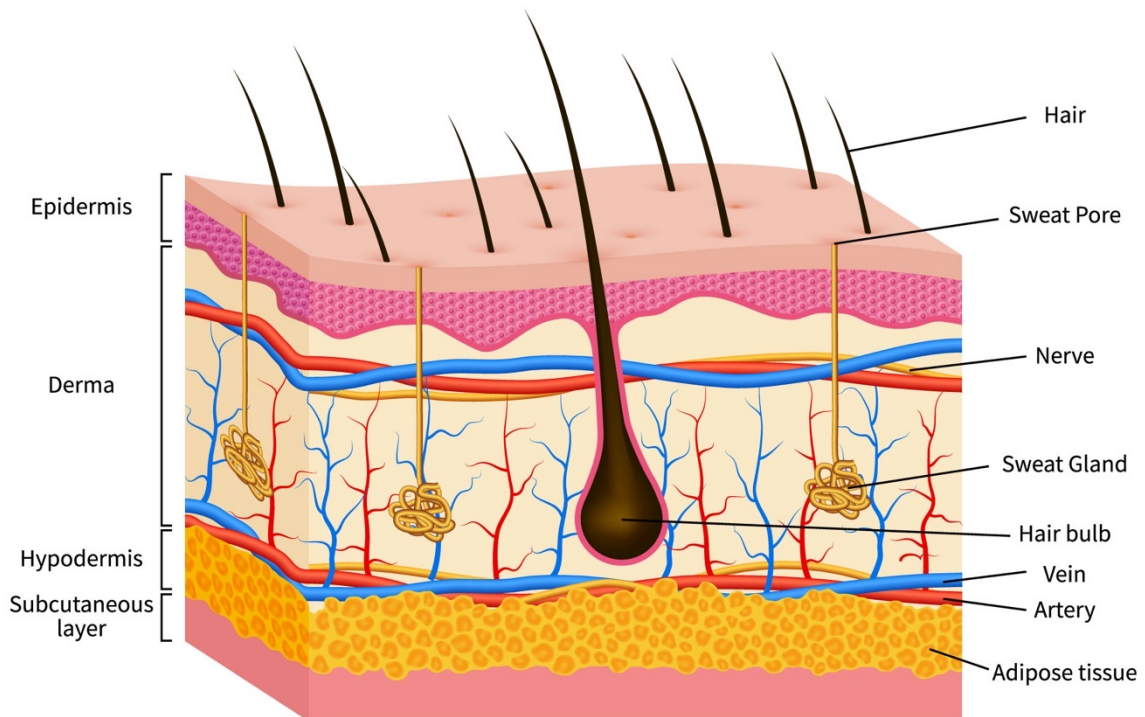
Dermis; about **0.1mm – 1mm**

Micropigmentation (Semi-Permanent Make up) (0.3mm – 0.8mm)

Hypodermis / Subcutaneous; about 1 – 3mm

Permanent Tattoos (2 – 3mm)

SKIN ANATOMY



Epidermis

The Epidermis is subdivided into 5 different layers:

1. Stratum Corneum (horny cell layer)

This is the uppermost layer of the skin and is exposed to all the harsh changes of the external environment as well as ultraviolet radiation. It is the layer that protects the skin from external factors, so it should be the strongest and toughest of all the layers.

2. Stratum Lucidum (clear cell layer)

It is composed of 3 – 5 layers of clear, flat, dead cells that have no nuclei. This layer is waterproof.

3. Stratum Granulosum (granular cell layer)

This consists of 3 – 5 layers of flattened cells whose nuclei are beginning to degenerate and die. This is because the cells are now far away from the nutrient supplying dermis and are becoming keratinised.

4. Stratum Spinosum (prickle cell layer)

Consists of 8 – 10 layers of many-sided, irregular cells that appear to be covered with prickly thorns or spines. These spines join the cells tightly to one another.

5. Stratum Basale (basal cell layer)

This is the deepest layer of the epidermis and is the layer closest to the dermis. It can receive nutrients and oxygen from it through the process of diffusion. It produces millions of new cells each day.

There are 4 cells that are found in these layers:

Keratinocytes– they make up about 90% of epidermal cells and they produce a protein called keratin. Keratin helps waterproof and protect the skin and the word itself, Kerato, means horny.

Melanocytes– produce a brown/black pigment called melanin. Melanin contributes to skin colour and absorbs ultraviolet light. Melanin granules form a protective layer over the nuclei of cells.

Langerhans cells– these arise from bone marrow and move to the epidermis. They respond to foreign bodies and thus play a role in skin immunity.

Merkel cells– these are only found in the stratum basale of hairless skin and are attached to keratinocytes. They make contact with nerve cells to form Merkel discs that function in the sensation of touch.